

**TAG 3.5 Explore**  
**An Overview of Isaac Newton's Laws of Motion**

Name \_\_\_\_\_  
Hour \_\_\_\_\_ Date \_\_\_\_\_

Read the top of p. 181. What will you be doing in this section?

**Newton's First Law of Motion**

Read the bottom of p. 181. What does Galileo have to do with Newton's First Law of Motion?

State the first part of Newton's First Law in your own words. Give an example other than the one in the book.



Read p. 182 through the top of p. 184.

State the second part of Newton's First Law in your own words. Give an example other than the one in the book.

Give an example of a thought experiment from our *Science Court* activity. (Hint: it also had to do with inertia.)

**Reflect**

1. What happened to the performance of your coaster car each time you reduced the friction? You might want to look back at your *Revising My Vehicle* page to make sure you remember what happened?
2. Imagine that you could remove all the friction from the wheel-and-axle system of the car. How would it perform if there were no friction in the car's subsystems?
3. Assume a car is traveling at a speed of 2 m/s when it comes off the ramp. How will its speed change as it continues traveling?
4. How is this thought experiment like Galileo's thought experiment?

**Thought Experiments**

Read pp. 185-186.

**Reflect**

1. In Galileo's experiment, the ball did not roll up any of the second ramps all the way to the height from which it was released on the first ramp. Why not?
2. What do you think would happen if Galileo's experiment was repeated using frictionless ramps?

3. Use what happens to the toy truck on the lab cart to describe what happens to a passenger when a car speeds up or stops suddenly.
4. In the car tests you have run so far, you have typically been seeing a vehicle either speeding up or slowing down. Why did your cars not remain in constant motion? How could you get your car to go at a steady speed, without any acceleration?
5. Think of two examples of Newton's first law of motion and complete the *Newton's First Law* sheet.

### **Newton's Second Law of Motion**

Read the bottom of p. 187 and the top of p. 188.

State Newton's Second Law in your own words:

Write the three ways the formula relating mass, force, and acceleration can be written.

Mass=

Net force=

Acceleration=

### **Thought Experiments**

Read this section on pp. 188-189 and complete the *Newton's Second Law* page.